

REMARKS/ARGUMENTS

This application contains claims 1, 2, 3 and 5 through 17. Claims 1, 12 and 13 (the independent claims) have each been amended to require that the "free radical inhibitor" used in said process have a phenothiazine nucleus. Free radical inhibitors having a phenothiazine nucleus are described as preferred throughout the Specification, are used in the Examples of the Specification, and were claimed specifically in original claims 3 and 5. Therefore, it is clear that no new matter has been introduced by the claim amendments. Claim 5 has been cancelled and Claim 3 has been amended to remove the subject matter added to the independent claim. Claims 10, 11 and 14 through 17 have been withdrawn due to a prior election of species requirement, but are to be rejoined upon a finding that the elected group of claims is allowable.

Claims 1 through 9, 12 and 13 were rejected under 35 USC Section 102(b) as being anticipated by, or in the alternative, under 35 USC Section 103(a) as being obvious in view of, EP 744393 (hereinafter "EP'393"), particularly Example 1 thereof. EP'393 is directed to a process for the ene formation a polyalkene-substituted succinic acylating agent in the presence of a dihalotriphenylphosphorane "catalyst". The presence of the specified catalyst is alleged to improve the yield of the reaction, and reduce tar generation. The process is described as applicable to those using conventional, as well as highly reactive polyalkene. Phenothiazine is used in certain of the comparative examples of EP'393, as shown in Table I of the reference. For each example that used phenothiazine as the catalyst, alone or in combination with N-bromosuccinimide, 1,3-dibromo-5,5-dimethylhydantoin, or tetrabromoethane, NAPVIS 120 was used as the polyisobutene reactant. NAPVIS 120 is not a highly reactive polyalkene and has a terminal vinylidene content of less than 30%, as attested to in the Declaration of Dr. Jacob Emert, which being submitted concurrent herewith. In each of these examples, a significant amount of tar was formed. The amount of sediment was not measured, although it is noted that the product of each of the examples was filtered after the introduction of a filtering aid (see paragraph 0020), suggesting that a significant amount of sediment was present.

As noted above, EP'393 fails to disclose an ene reaction of a polyalkene having a terminal vinylidene content of at least 30%, and an enophile, in the presence of a phenothiazine free radical inhibitor. Therefore, EP'393 fails to anticipate the invention, as now claimed, under 35 USC Section 102(b). As further noted above, EP'393, mentions the use of phenothiazine only in comparative examples employing only conventional polyalkene. EP'393 fails to describe

phenothiazine as having any effect on sediment formation in an ene reaction of a polyalkene and an enophile agent, much less that the presence of phenothiazine will have a profound effect on sediment formation when the polyalkene has a high terminal vinylidene content. The test data of the present Specification clearly demonstrates that the presence of phenothiazine results in reductions in sediment to levels that require no filtering of the reaction product when high terminal vinylidene polyalkene is used (Table 2), and that this result is not achieved in processes employing polyalkene having low terminal vinylidene contents. Therefore, EP'393 also fails to render the present invention obvious under 35 USC Section 103(a).

Claims 1 through 9, 12 and 13 were further rejected under 35 USC Section 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, each of independent claims 1, 12 and 13 include the phrase "in the substantial absence of halogen". This has been interpreted to mean that no halogen or halogenated compounds may be added to the process. It is then argued that, as certain free radical inhibiting compounds described as useful in the invention are halogenated, the claims are unclear. Applicants respectfully traverse this rejection.


As noted in the present Specification, and as is well known to those skilled in the art, there are two distinct processes for reacting a polyalkene and an enophile. In a halogen-assisted reaction, the polyalkene and enophile are reacted in the presence of free halogen (such as chlorine gas), or the polyalkene is first reacted with a halogen to form a halogenated polyalkene, which is then reacted with the enophile. The halogen-assisted reaction provides high yields, but the resulting products contain residual halogen. In a thermal reaction, the polyalkene and enophile are reacted (generally at higher temperatures), without "halogen assistance". The resulting products are free of residual chlorine, although the reaction generally takes longer and/or has a lower yield. The invention is directed to a thermal, or "ene" reaction, as opposed to the halogen-assisted reaction. Based on this description, one skilled in the art would interpret "in the substantial absence of halogen" to mean that the reaction is conducted without halogen assistance; halogen in a form capable of accelerating the reaction of the polyalkene and enophile is not provided in amounts sufficient to affect the reaction rate/yield.

In the present invention, where a halogenated phenothiazine compound is selected as the free radical inhibitor, the halogen is bound to the phenothiazine compound and is not available to

halogenate the polyalkene. Further, in the process of the present invention, the free radical inhibitor is used in amounts of only about 10 to 3000 ppm, and halogen (in a halogenated phenothiazine compound) represents only a small mass % of the halogenated phenothiazine compound. Therefore, where a halogenated phenothiazine compound is used, the halogen is not in a form capable of assisting the reaction, and is present in only miniscule amounts. Thus, the process of the invention is conducted in "the substantial absence of halogen", even when a halogenated phenothiazine compound is employed as the free radical inhibitor.

Based upon the foregoing, applicants submit that the present claims are in proper formal order and distinguish over the single cited prior art reference. Applicants therefore respectfully request that the rejections presented under 35 USC Section 102(b), 35 USC Section 103(a) and 35 USC Section 112, second paragraph, be withdrawn and that the application be passed to issue.

Respectfully submitted,



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